



Photography by Martin Page

Paeonia Itoh hybrids

PEAONIES are among the most beautiful of all flowering plants. Herbaceous peonies have been grown in Western and Eastern gardens for centuries but tree peonies are more recent arrivals, first introduced to the West in 1789. Because of their different flowering periods and the fact that they are not closely related within the genus, it had always been assumed that it would be impossible to cross the two groups. This had been a goal of breeders wishing to introduce the rich yellow of tree peonies into herbaceous types.

However, in 1948 Toichi Itoh, a Japanese nurseryman, succeeded in crossing *Paeonia x lemoinei*, a hybrid tree peony, with *P. lactiflora* 'Kakoden', a white-flowered herbaceous peony.

MARTIN PAGE explains the history and garden performance of intersectional hybrid peonies

The latter was used as the seed parent. Nine of the original 36 seedlings from his cross had the dominant characteristics of a tree peony and became the first Itoh hybrids, while the remainder were herbaceous. Itoh died in 1956, before any of his seedlings had flowered, and his achievement may have remained

unrecognised were it not for the intervention of Louis Smirnow, an American horticulturist.

Smirnow obtained permission from Itoh's widow to patent four of the plants in the late 1960s. He named them 'Yellow Crown', 'Yellow Dream', 'Yellow Emperor' and 'Yellow Heaven'. Peonies are hugely popular in the United States and these new plants understandably caused a terrific stir among peony breeders.

The American Peony Society (APS) named this new group of plants Itoh Hybrids Group when revising its exhibition schedules in the mid 1970s. However, this decision has not been universally accepted and some breeders simply call them intersectional hybrids – between section



Intersectional peony hybrids, resulting from crosses between herbaceous and tree peonies, have been produced in a range of colours and forms (above and left). Their flowers resemble those of tree peonies but the plants are herbaceous, vigorous and hardy. Those starting to come into cultivation include: 1 *Paeonia* 'Canary Brilliants', 2 *P.* 'Court Jester', 3 *P.* 'Garden Treasure', 4 *P.* 'Kopper Kettle', 5 *P.* 'Scarlet Heaven' and 6 *P.* 'Sequestered Sunshine'

Moutan (tree peonies) and section *Paeon* (most herbaceous peonies).

The development of these plants has increased the range of colours available for herbaceous peonies and introduced the flares (contrasting colour markings at the petal base) that are so characteristic of tree peonies.

Desirable characteristics

These intersectional hybrids are extremely vigorous and appear to have good resistance to peony blight (*Botrytis paeoniae*), which can be a problem in Britain's damp Atlantic climate. The plants look superficially like tree peonies but are herbaceous and die back in autumn. They form a dome-shaped plant up to 90cm high and bear single, semi-double or

double flowers up to 20cm across.

Paeonia 'Garden Treasure' (*P. lactiflora* 'Carr East #2' x *P. x lemoinei* 'Alice Harding') was introduced in 1984 by Don Hollingsworth of Missouri and is the only intersectional hybrid to have received a gold medal from the APS. Demand for Roger Anderson's 'Bartzella' (*P. lactiflora* double white cultivar x *P. x lemoinei* 'Golden Era') raised in 1986 was so great during the late 1990s that divisions were sold for \$1,000 each. Both have golden-yellow flowers, but 'Bartzella' is slightly more double than 'Garden Treasure' and, when mature, plants of both cultivars may produce as many as 50 flowers in one season.

Intersectional hybrids typically

flower in late spring or early summer, midway between the two parent groups. They are the first peonies that are capable of repeat-flowering and may produce a second, smaller flush of flowers if the whole plant is cut down immediately after the flowers have faded (according to Anderson).

Micropropagation success

The price of cultivated peonies has always been rather high because they have to be propagated by vegetative division. There have been several attempts to micropropagate them, but the young plants usually succumb to fungal pathogens when they are transferred to compost (Habib and Donnelly 2001, Hansen *et al* 1995, ►

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Harris and Mantell 1991). However, in 2004 Canadian company Planteck Biotechnologies Inc announced that it had achieved a high success rate and is now marketing micropropagated peonies. The high value of intersectional hybrids has made them an attractive proposition for micropropagation. Plants are much smaller than those produced by division, but should flower within two or three years.

Morphology

Most intersectional hybrids look more like tree peonies than their herbaceous parent. At first sight the stems appear completely deciduous, but closer inspection reveals that the internodes between the buds are extremely short, resulting in one or two buds being held a short distance above the surface of the soil. Short, partially woody stems are produced by some cultivars but these are usually damaged by the first hard frost. The leaves are biternate and appear intermediate between those of tree and herbaceous peonies. The carpels are surrounded by a leathery disc

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Wisconsin breeder Roger Anderson (here with a *Paeonia* seedling) has spent the past three decades raising some 400 intersectional hybrids including lavender-pink *P.* 'First Arrival' (below)

(sometimes called the sheath) typical of tree peonies. Intersectional hybrids are planted so that the first bud is about 2.5cm above ground level and cut back to the uppermost bud in autumn (Page 2005).

Hybridisation techniques

In most cases *P. lactiflora* has been used as the seed parent and *P. x lemoinei* as the pollen parent. This is because *P. lactiflora* flowers about one month later than tree peonies. The tree peony pollen has to be stored in a dessicator then applied to *P. lactiflora* when it flowers. Breeders are now investigating the possibility of using tree peonies as the seed parent, a development that requires forcing *P. lactiflora* into flower early.

Interest in raising Itoh hybrids has accelerated during the past decade and at the time of writing there are approximately 50 registered cultivars. *Paeonia lactiflora* 'Kakoden', Itoh's original seed parent, is rarely grown in the USA and breeders have tried to find a more readily available



alternative. They have experimented with a number of cultivars of *P. lactiflora* but greatest success has been achieved with pale pink 'Carr East #2', light pink 'Martha W.' and white 'Miss America'.

Unfortunately, all the intersectional hybrids that have so far been raised are sterile triploids. The flowers are often multi-carpelled with 2–3 times the usual number of carpels and, while they appear normal, they are incapable of producing viable seed. The stamens in these flowers are often reduced to vestigial filaments but if anthers are produced these rarely contain viable pollen.



Another Roger Anderson hybrid is *Paeonia* 'Unique' that first bloomed in 1986. The single, red flowers are unusual in this group of hybrids and it is also noted for its finely dissected foliage and vigour

If a fertile F₂ hybrid were produced, the resulting plant could be back-crossed with *P. lactiflora*, thus increasing the latter's contribution to the gene pool. Cultivars could then be produced with more doubling in the flower and greater fragrance.

USA breeders

There are four main breeders of intersectional hybrid peonies, all based in the USA. Don Hollingsworth, who introduced *P.* 'Garden Treasure', registered three cultivars in the 1980s but has since concentrated on producing herbaceous hybrids.

Roger Anderson of Fort Atkinson, Wisconsin, is probably the best-known breeder and has raised about 400 cultivars, of which 40 or so have been registered. His best-known plants are *P.* 'Bartzella' (see below), *P.* 'First Arrival' (lavender-pink with reddish-purple flares) and *P.* 'Cora Louise' (white with lavender flares). His *P.* 'Kopper Kettle' (the raiser's intended spelling but apparently registered as 'Copper Kettle') has

semi-double flowers of red, orange and yellow in a layered effect that gives the overall impression of copper. *Paeonia* 'Sequestered Sunshine', another Anderson hybrid, with semi-double yellow flowers, is gaining sales in the cut-flower market.

Don Smith, of West Newton, Massachusetts has taken a systematic approach to breeding. He introduced *P.* 'Impossible Dream', claimed to be a direct cross between a Japanese tree peony and a cultivar of *P. lactiflora* (Smith 2004). The plant has lavender-pink flowers and near-white flares.

William Seidl of Manitowoc, Wisconsin registered several cultivars in 1989 including *P.* 'White Emperor' (white with purple flares) and *P.* 'Rose Fantasy' (fuchsia-rose with darker flares).

Recommended cultivars

■ 'Bartzella' has semi-double, golden-yellow flowers with red flares. Slightly more double than *P.* 'Garden Treasure', a mature plant may produce up to 60 flowers in summer.

■ 'Court Jester' is an unusual plant with single, pale orange flowers and deep red flares. The flowers are slightly irregular and as they age, the flares turn violet-purple and the petals become yellow.

■ 'Garden Treasure' has semi-double, golden-yellow flowers, larger than the original Itoh hybrids, with small scarlet flares. It eventually forms a plant 0.9 x 1.5 m.

■ 'Scarlet Heaven' (*P. lactiflora* 'Martha W.' x *P. x lemoinei* 'Thunderbolt') has single, bright blood-red flowers.

■ 'Unique' (*P. lactiflora* 'Martha W.' x *P. delavayi* Trolloides Group) has single, bright purplish-red flowers and pale green carpels.

■ 'Yellow Crown', 'Yellow Dream', 'Yellow Emperor' and 'Yellow Heaven' have semi-double, deep yellow flowers with light red flares and a white sheath.

Improving availability

Some of the cultivars mentioned above are now filtering through to the UK, and are available from specialist nurseries (see Suppliers box below).

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SUPPLIERS

Callie's Beaux Jardins, 10875 Old Highway, 169 Boulevard, Belle Plaine, Minnesota 56011 USA

Claire Austin Hardy Plants, The Stone House, Cramp Pool, Shifnal, Shropshire TF11 8PE www.claireaustin-hardyplants.co.uk

Hollingsworth Peonies, Route 3, Box 27 Maryville, Missouri 64468 USA www.hollingsworthpeonies.com

Kelways Ltd, Langport, Somerset TA10 9EZ www.kelways.co.uk

Song Sparrow Perennial Farm, 13101 East Rye Road, Avalon, Wisconsin 53505 USA www.songsparrow.com